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May 23, 2022

In reply, reference letter number: G-CAO-22-100806

U.S. Department of Transportation
Docket Operations
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue, SE.
Washington, DC 20590

Subject: Response to Request for Additional Information in Support of Revision to Exemption No. 10188A – Exemption from Section 25.813(e) of Title 14 Code of Federal Regulations, Emergency Exit Access

Reference(s):
1) Regulatory Docket No. FAA-2010-0446, Exemption No. 10188, dated December 27, 2010, Exemption from Section 25.813(e) of Title 14, Code of Federal Regulations
2) Regulatory Docket No. FAA-2010-0446, Exemption No. 10188A, dated June 12, 2020, Exemption from Section 25.813(e) of Title 14, Code of Federal Regulations
3) G-CAO-22-100395, Request for Revision to Exemption No. 10188A – Exemption from Section 25.813(e) of Title 14, Code of Federal Regulations, Emergency Exit Access, dated March 10, 2022
4) FAA letter in response to GAC letter G-CAO-22-100395, sent April 29, 2022

ODA Project Number(s): AT-01-2015-0017

Dear Sirs:

Gulfstream is providing a response to FAA letter sent April 29, 2022 (Reference 4), which requested additional information to support consideration of Gulfstream's request for an amendment to Exemption No. 10188A to add the Gulfstream GVIII-G800 model aircraft.

In accordance with 14 CFR Part 11, Gulfstream Aerospace Corporation requested consideration to revise Regulatory Docket No. FAA-2010-0446, Exemption No. 10188A, dated June 12, 2020, (Reference 2) originally issued to relieve the Gulfstream GVI model aircraft from full compliance with 14 CFR 25.813(e) at amendment 25-116, Emergency Exit Access (Reference 1) and revised to include the Gulfstream GVIII-G700 model aircraft. Gulfstream requested a revision to the exemption to include the Gulfstream GVIII-G800 model aircraft, a derivative model of the GVI aircraft (Reference 3).

Gulfstream is providing the following information to support consideration of the requested revision to the exemption to include the Gulfstream GVIII-G800 model aircraft, a derivative model of the GVI aircraft (Reference 3):

1. FAA Comment: The requested relief is for the Model GVIII-G800 airplane. However, the FAA understands the GVIII-G800 is a marketing name and not the name that will be on the Type Certificate Data Sheet (TCDS). Please clarify and provide a revised petition for exemption with the official name that will be on the TCDS that will align with the certification basis in lieu of the marketing name.

   Gulfstream Response:

   The model number to appear on the TCDS will be GVIII-G800. Gulfstream notes that G800 is the marketing name.

2. FAA comment: Please elaborate further on how this request does not adversely affect safety, and how it provides a level of safety at least equal to that provided by the rule as noted in 14 CFR § 11.81(e).

   Gulfstream Response:

   Gulfstream is providing the following information to elaborate further in support of 14 CFR § 11.81(e).

   The following GVIII-G800 design features will ensure that the passengers' ability to effectively identify the exit is not diminished. These design features will provide an overall level of safety equivalent to that of 25.813(e) Amendment 25-128.

   - The interior doors will be designed to automatically open (stow) based on the airplane being configured for landing and will remain open until the airplane has returned to an airborne flight configuration. The installation of the interior doors will therefore not adversely affect the passenger recognition of the Main Entry Door (MED).
   - The interior doors will only be installed forward of the passenger seating area and between passenger seats and the MED. The MED is the only door available to enter the aircraft and its location is inherently established for all passengers upon boarding.
   - Emergency exit locator, marking signs, and emergency lighting will be provided. Gulfstream will comply with the criteria defined in ELOS AT5177AT-T-C-1 (ELOS to 14 CFR 25.811(d) and 14 CFR 25.812(b)).
   - The overwing emergency exits are optimally located in the passenger compartment, in clear and obvious view, and are in an area of high passenger density. These exits will also be indicated via locator signs and markers, as well as emergency escape path lighting. This heightened passenger awareness and ease of identification will increase the likelihood of passengers utilizing the overwing exits provided in the cabin versus defaulting to the entry door.

The following design features of the GVIII-G800 interior doors and passenger cabin will ensure that the passenger's ability to effectively egress the aircraft is not diminished by ensuring that the doors will be open for taxi, take-off, and landing without requiring passenger or crew action. These design features will provide an overall level of safety equivalent to that of 25.813(e) Amendment 25-128.

- The interior doors will be designed to automatically open (stow) when the airplane has been configured for landing (gear down or flaps down).
- The operation of the interior door to be closed (deployed) position will require manual activation. The doors will be designed so that they can only be closed (deployed) when the gear and flaps are fully retracted (airborne configuration), or for ground maintenance activity.
- The interior doors will be designed so that, in case of any failure of the closing/latching mechanism, they will default to the open (stowed) position.
- In accordance with Gulfstream's approach to compliance with 14 CFR 25.1309, the failure to egress through any individual emergency exit is classified Major. Gulfstream will demonstrate that the probability of failure to egress through the Main Entry Door (MED), including the probability of failure of both interior doors, will meet the criteria for a failure scenario classified as Major. This will include conducting a quantitative analysis that shows the probability of this scenario to be less than 10^{-5} per flight hour. This hazard criticality is based on 14 CFR 25.783(b)(2).
- The interior doors will have a hold-open feature that will be shown to react all emergency landing loads specified under 14 CFR 25.561(b).
- The interior doors will be placarded to be open and latched for taxi, take-off, and landing (TT&L). Manual operation to the open (stowed) position is the primary means by which the doors should be open and stowed for TT&L. The automatic opening feature will ensure egress paths in the event that manual operation has not occurred.
- An amber CAS message will alert pilots if an interior door is not in a properly open (stowed) position for TT&L.
- With the interior doors in the open (stowed) position, the critical forward emergency landing loads will not cause door to deploy and block access to the main entry door.
- The overwing emergency exits have been designed so that they can all be deployed at the same time to provide multiple, redundant egress paths for escape from the passenger compartment. Each of the four overwing emergency exits require single file egress and have been sized to provide substantial egress area. This reduces the problems caused by passenger panic and congestion typical in single, larger exits. Smooth, effective egress of passengers through the existing overwing exits will also increase the likelihood of passengers utilizing the overwing exits as opposed to seeking alternate escape routes further away (MED).
- Both interior doors will be designed to be frangible from either side of the door. In case of an emergency, this design will allow a 5^{th} percentile female to create an aperture large enough to allow for a 95^{th} percentile male to escape.

3. FAA comment: Please elaborate further on how this request is in the public interest per § 11.81(d).

Gulfstream Response:

Gulfstream is providing the following information to elaborate further on how granting this request would be in the public interest.

a) Reduced emissions

The model GVIII-G800 is equipped with Rolls-Royce BR700-730B2-14 (Pearl 700) engines. When compared under similar conditions to the previous generation Rolls-Royce engines used on the earlier Gulfstream model airplanes, the Pearl 700 engine significantly reduces specific fuel consumption, NOx emissions, and visible smoke. Since customers desire to have these interior doors to maintain an acceptable acoustic level in the passenger cabin and pilot compartment and provide separation between the passenger area and crew area, they may opt for an older aircraft with higher emissions, in lieu of the GVIII-G800. Granting this exemption to allow for the installation of certain cabin doors between the passenger seating areas and the main entry door would incentivize business jet operators to replace older aircraft with model GVIII-G800 airplanes.

This would result in reduced emissions, a benefit to the general public.

b) Reduced noise

The model GVIII-G800 is equipped with Rolls-Royce BR700-730B2-14 (Pearl 700) engines. For comparison, the model GVIII-G800 Rolls-Royce BR700-730B2-14 (Pearl 700) engines produce less noise when compared to the previous generation Rolls-Royce engines. Since customers desire to have these interior doors to maintain an acceptable acoustic level in the passenger cabin and pilot compartment and provide separation between the passenger area and crew area, they may opt for an older aircraft with higher noise levels, in lieu of the GVIII-G800. Granting this exemption to allow for the installation of certain cabin doors between the passenger seating areas and the main entry door would incentivize business jet operators to replace older aircraft with model GVIII-G800 airplanes.

This would result in reduced noise pollution in airport areas and their surroundings, a benefit to the general public.

c) Fostering a competitive national aviation industry

The ability to provide additional cabin separations to maintain an acceptable acoustic level in the passenger cabin and pilot compartment and provide separation between the passenger area and crew area is being requested by prospective aircraft operators who compare the GVIII-G800 with products of European and other foreign aircraft manufacturers. The limitation on installation of certain cabin doors between the passenger seating areas and the main entry door adversely affects the ability of the model GVIII-G800 to compete with older aircraft and with current airplanes that do not have a similar limitation due to differing cabin configurations. The European Union Aviation Safety Agency (EASA) amended their certification specifications (CS-25) to introduce airworthiness requirements for non-commercially operated airplanes and low-

occupancy airplanes in order to minimize the burden associated with certification of executive interiors. The inability to provide such features on FAA certified airplanes will ultimately cause a reduction in prospective sales and a reduction in the competitiveness of the national aviation industry when the FAA's ultimate goal is to harmonize the regulation with EASA Appendix S requirements.

Granting this exemption would help to foster a competitive national aviation industry, which is a benefit to the general public.

d) Improved fuel economy and lower operating costs

The model GVIII-G800 Rolls-Royce BR700-730B2-14 (Pearl 700) engines have improved specific fuel consumption compared to the previous generation Rolls-Royce engines. Since customers desire to have these interior doors to maintain an acceptable acoustic level in the passenger cabin and pilot compartment and provide separation between the passenger area and crew area, they may opt for older aircraft with worse specific fuel consumption, in lieu of the GVIII-G800. Granting this exemption to allow for the installation of certain cabin doors between the passenger seating areas and the main entry door would incentivize business jet operators to replace older aircraft with model GVIII-G800 airplanes.

These effects would result in improved overall fuel economy and an associated reduction in operating costs for business jet operations. This is a benefit to the business travelling public, who would experience the improved overall fuel economy and an associated reduction in operating costs for business jet operations.

e) Advancement of Aircraft Safety

Granting this exemption to allow for the installation of certain cabin doors between the passenger seating areas and the main entry door would incentivize business jet operators to replace older aircraft with model GVIII-G800 airplanes. Since customers desire to have these interior doors to maintain an acceptable acoustic level in the passenger cabin and pilot compartment and provide separation between the passenger area and crew area, they may opt for aircraft designed to an earlier certification basis, in lieu of the GVIII-G800. This will restrict advancements in safety introduced by Gulfstream with the GVIII-G800, not only in the areas of the cabin safety, but throughout the airplane.

This is counterproductive to both Gulfstream and the FAA's goal of continuous improvement in overall safety. The advancement of aircraft safety is in the interest of the public.

4. FAA Comment: Clarify what is being requested with regards to the EASA referenced information. Section 25.813 (e) and Certification Specification (CS) 25.813(e) do not appear on the EASA Significant Standard Differences List. Please clarify if Gulfstream is trying to address § 11.81(h) with this information. If that is the intent can Gulfstream please provide additional information as noted in § 11.81(h).

Gulfstream Response:

Gulfstream notes that the request for revision to Exemption No. 10188A to include the GVIII-G800 (Reference 2) does not include any EASA referenced information. Per 14 CFR 11.81(h), Gulfstream requests that consideration be given to extending this exemption for operation outside of the United States. Gulfstream aircraft are routinely registered and operated outside of the United States and projections are the same for the Model GVIII-G700. Granting this extension of privileges will allow for operations based within foreign countries, having bilateral agreements with the United States accepting FAA 14 CFR Part 25 as their airworthiness standard for transport category aircraft. Gulfstream believes that limiting this exemption to use within the United States would put unfair restrictions on the marketability of this aircraft.

5. FAA Comment: Please address the regulatory amendment differences. Under "Factors Supporting the Petition" Gulfstream references the features are identical to those described in Exemption 10188. Exemption 10188 is for § 25.813(e) at amendment 25-116, the GVIII-G800 is at amendment 25-128.

   Gulfstream Response:

   Gulfstream notes that although 14 CFR 25.813 was revised at Amendment 25-128, subparagraph (e) of 25.813 remained the same between amendment level 25-116 and 25-128. Because of this, Gulfstream does not believe there is any regulatory amendment difference for 14 CFR 25.813(e).

6. FAA Comment: Please address the differences in this request versus Exemption 10188 for the following item under Factors Supporting the Petition. Exemption 10188 notes that the GVI has Emergency exit locator and marking signs and emergency lighting in accordance with §§ 25.811 and 25.812. However, this request notes the emergency exit locator, marking signs, and emergency lighting provided comply with the criteria defined in ELOS AT5177AT-T-C-1 (ELOS to §§ 25.811(d) and 25.812(b)). Please provide information showing how the ELOS for the emergency lighting does not affect or change the equivalency of the request. Please address how the cumulative effect of the two ELOS combined do not affect safety.

   Gulfstream Response:

   Gulfstream and the FAA have experience with the combination of these two items on both GVI and GVIII-G700 platforms. Project level reviews and compliance determinations on these two projects have confirmed no negative impact on safety. Additional proprietary details will be provided separately to Myra Kuck within 30 days of this letter.

7. FAA Comment: Please provide the differences in this request versus Exemption 10188 for the following item under Additional GVIII-G800 Design Considerations. Exemption

10188 notes the GVI aircraft complies with § 25.807 (g) for required number of emergency exits and § 25.807(i) for ditching. However, this request notes that there is an ELSO TC8700AT-T-C-1 for §§ 25.807(a)(3) and 25.807(g)(2)(3) for emergency exits and § 25.807 (g) (i)(2) for ditching. Please provide information showing how the ELOS for emergency exits and ditching does not affect or change the equivalency of the request. Please address how the cumulative effect of the two ELOS combined do not affect safety.

Gulfstream Response:

Gulfstream and the FAA have experience with the combination of these two items on both GVI and GVIII-G700 platforms. Project level reviews and compliance determinations on these two projects have confirmed no negative impact on safety. Additional proprietary details will be provided separately to Myra Kuck within 30 days of this letter.

Should you have any further questions, or require any additional information, please contact CAO Airworthiness Engineering Specialist Andrea Burkhardt at Andrea.Burkhardt@gulfstream.com or (912) 251-1712 (office), or TC Program Administrator Tom Strohmayer at Thomas.Strohmayer@gulfstream.com, (912) 395-7778 (office) or (912) 433-6002 (mobile).

Respectfully,

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